

Sound Democrat Mill
Placer Creek Valley
Silverton Vicinity
San Juan County
Colorado

HAER No. CO-69

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COLO
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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Historic American Engineering Record
National Park Service
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HISTORIC AMERICAN ENGINEERING RECORD

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SOUND DEMOCRAT MILL

HAER No. CO-69

I. INTRODUCTION

Location: Placer Creek, 8 miles northeast of Silverton, San Juan County, Colorado

Quad: Silverton

UTM: A 13:271 885E: 4199 010N
B 13:271 885E: 4198 625N

Date of Construction: 1905-1906, 1909

Present Owner: Bureau of Land Management
Montrose District
Montrose, Colorado

Present Use: Derelict on public land. The site is an attraction near a four-wheel drive road across the scenic San Juan Mountains and has been used for recreational camping and picnicing.

Significance: The Sound Democrat Mill is a seven stamp, five concentration table, ore-processing mill built in 1905-1906, and remodeled in 1909. It is a typical amalgamation and concentration stamp mill built to treat gold and silver-lead ores. Located in an isolated valley at 12,000 feet in the San Juan Mountains, it is the last standing stamp mill in the productive Eureka district, and one of the most complete stamp mills remaining in Colorado.

Prepared by: Robert L. Spude, National Park Service, Rocky Mountain Region, Denver. August 1991.

II. HISTORY

A. Introduction to Gold Production in Colorado

Colorado, one of the most productive mining States and second after California in gold production, has a host of mining regions divided into 44 mining districts. According to the United States Geological Survey, Colorado has four of the top twenty-five gold-producing mining districts: Cripple Creek (#2), Central City (#11), Telluride (#14), and Leadville (#16).¹ Each of these four districts was part of a larger mining region. The rich Telluride district was part of the Southwest Colorado mining region of the San Juan Mountains, which included mines at the Rico, Ouray, Lake City, Creede, Silverton, and the Eureka districts. The Sound Democrat mine was located in the Eureka district.

Prospectors discovered the lodes of the San Juan Mountains in the 1860s and 1870s, then sold their claims to mining corporations organized usually in the East to fund the opening of mines and the building of mills. The initial capital outlay was high, but if the mine proved to have commercial grade ore, profits would follow. Of the hundreds of mills built in the American West, however, few paid for their initial cost. The U. S. Bureau of mines compiled lists of mills operating in the West; of the hundreds listed few were attached to productive mines. Fewer still paid dividends. The Sound Democrat mill, one of the mills listed in Colorado in 1911, had limited production.²

Of all the mills listed by the Bureau of mines in its 1911 report, none operate today. Although no systematic inventory of all standing mills has been undertaken in Colorado, knowledgeable individuals recall no single, historic mill in the San Juan Mountains that still stands with its machinery intact, except the Sound Democrat.³ None of the historic mills of Cripple Creek remain; only one of the early mills of Leadville remain, the Champion mill, which is near collapse; and only the historic Argo mill in the Clear Creek region remains, although much of its machinery has been removed. The Sound Democrat mill in the Eureka District of the San Juan Mountains may be the best remaining example of a stamp mill in Colorado.

Stamp mills that use amalgamation to extract gold originated in Europe. Amalgamation is an ancient process in which mercury is used to extract gold from its ores. Gold has an affinity for mercury, a phenomena known by the Romans. In the Middle Ages, especially in Germany, crushing technology was developed in which metal stamps were dropped on ores, crushing it finely. Then, the crushed ore passed over sheets covered with mercury where the gold was extracted from the sand-like waste rock. This was the technology imported into the American West in the 1850s. Stamp mills were improved during the California and Colorado gold rushes. Water

power was replaced by steam engines and, later, electricity. Thousands of these mills were built throughout the American West until the technology of amalgamation was replaced by flotation and the cyanide process. The Sound Democrat mill reflects a universal technology, stamp milling and amalgamation, which has vanished from the active gold mining districts of today.⁴

B. The Eureka District, San Juan Mountains, Colorado

The Eureka District is northeast of Silverton, Colorado. Between the headwaters tributaries of the Animas River -- Eureka Creek and Placer Gulch -- at 12,000 feet and on the south slope of Hanson Peak (13,545 feet), a series of mines were opened that produced over \$50,000,000 worth of gold, silver, lead and zinc between 1875 and 1923.⁵ The ores mined were free gold, galena (silver-lead), and chalcopyrite (a copper ore) with small amounts of native silver, native copper and zinc blend.⁶ These metals required a certain type of metallurgy to remove them from their host rock; that metallurgy is exemplified by the Sound Democrat mill.

A band of prospectors who discovered gold in the headwaters of the Animas River formed the Eureka Mining District on August 16, 1873. Two days later Reuben J. McNutt and George Howard staked the quartz outcroppings of the Sunnyside vein, the district's biggest producer. Other claims along and near the lode were staked, including the Sound Democrat, but not until after the conclusion of the Brunot Treaty that ceded the lands from the Ute Indians in 1874.⁷ Henry Promer located the Sound Democrat claim on August 7, 1875.⁸ Vagabond prospectors like Promer were seeking easy-to-work gold ores (ores with high-grade, free-gold or placer deposits), which the Sound Democrat lacked. The claim would require capital invested in mine openings and mills before it would return a profit. If prospectors had claims lacking easy-to-work gold, they usually quickly abandoned or sold them to area merchants. Promer may have abandoned his claim, but relocated it with the increased activity in the Eureka district in the 1880s.⁹

The arrival of the Denver & Rio Grande Railroad in Silverton, five air miles from the Eureka District, and the construction of smelters to work the district ores caused the economical opening of the mines along the Sunnyside Lode. The smelter at Durango, fifty railroad miles to the south of Silverton, became the key to metallurgical success in the region. During the 1880s ores were packed by burro from the mines down the 2,000 feet elevation and ten trail miles to the railroad. In the mid to late 1880s a number of small stamp mills were built along the lode: the Sunnyside mill, the Hanson mill, and the Mastodon mill.¹⁰

These mills were typical amalgamation and concentration mills. Most of the gold would be captured in the amalgamation tables, but other metals had to be extracted by

smelting, which processed the "concentrates" from mills. The concentration mill or "concentrator" would treat low grade ores and by crushing the rock to a sand and then, using gravity and water on concentration or shaker tables, would separate the light waste rock from the heavier metal.¹¹ Thus, an ore worth \$50 per ton was upgraded four to six times to a "concentrate" worth \$200 to \$300 per ton. This higher grade concentrate could be shipped to smelters and, after paying the expense of transport via burro pack train, wagon, and railroad, produce a profit that might equal \$50 per ton.

The development of the metallurgical processes, and the economical transportation system needed to open the Eureka district was complete by the 1890s. That system included the integrated operation of mine, mill, smelter and cheap transportation. The mills were improved by the perfection of the Wilfley concentration table in 1896.¹² The operation of the smelter at Durango, acquired by the Guggenheims' American Smelting and Refining Company (ASARCO) provided economical ore processing.¹³

Other important technological innovations were the perfection of the aerial tramway. The two-wire Bliechert system was perfected in the 1890s and made possible the transporting of ores from isolated cliff faces, above timberline, to mills and rail spurs up to 16,000 feet distant.¹⁴ The advent of electrical power completed the conditions that made mining of low grade ores in the San Juan Mountains feasible. During the decade, 1895-1905, a dozen mills were built to work the ores in the vicinity of the Sound Democrat.¹⁵

The potential of the district mines increased with the expansion of the railroad. In 1895-6, the narrow gauge Silverton & Northern Railroad was built the seven miles from Silverton to Eureka, four steep trail miles from the mines in the Eureka District. In 1905 the line was further extended from Eureka to Animas Forks, only two miles along an easy trail from the Sound Democrat mine. The towns of Eureka and Animas Forks became trade centers and railroad shipment centers for the surrounding mines. With the railroad, mines like the Sound Democrat became valuable.¹⁶

In 1895, the prospector Promer and his partners sold the Sound Democrat mine to William G. White, an early merchant in the Eureka District and later a prominent merchant of the expanding railroad and smelting center of Durango.¹⁷ He interested mining man John James in the property. Together they opened the claim and in 1897 were reportedly shipping high-grade ores to the Durango smelter. Rather than invest in building a mill, they leased the mine to the owners of the nearby Sunnyside mine, the major operation in the Eureka District. The property was developed by Judge J. H. Terry, a pioneer Colorado mining man.¹⁸

Judge Terry developed the Sunnyside into a profitable venture and speculated on surrounding mines. Through local mining man John A. James he secured a lease of the property and put his son Joe Terry in charge as manager. During 1898-1899, Joe Terry had as many as twenty-four men working the Sound Democrat mine and shipping its high-grade gold ores to the Sunnyside mill. They shipped the gold bullion to the Denver mint and the mill concentrate went to the Durango smelter. In the spring of 1900, the Terrys proposed spending \$100,000 to build a mill on the Animas Fork and build a tramline from the mine to the mill. Nothing came of the proposal. Either the owner, William White, desired too much for his property or was unwilling to extend the Terrys' lease and desired to operate on his own; for whatever reason, the Terrys withdrew from the Sound Democrat mine after opening the mine and milling 700 tons of ore. The Terrys focused their energy on the Sunnyside, which had hit a high-grade ore body.¹⁹

The Terrys' Sunnyside bonanza would help cause a boom in the district. On July 4, 1901, they found a new vein, "The Fourth of July Vein," after following a hunch to cut across barren quartz into new ground. The new discovery extended the life of the Sunnyside, while tempting investors to speculate on mines in the vicinity which might develop their own ore bodies in supposed barren ground. Within the next four years many gold mines were bought by eastern investors and, in 1905, eight major operations were underway; the Sunnyside and Gold King were expanding operations and the six others were building mills: Old Hundred, Grand Mogul, Green Mountain, Hamlet, Gold Prince and the Sound Democrat.²⁰

The biggest boon to the immediate vicinity of the Sound Democrat mine was the operation of the Gold Prince Mining Company. The Terrys sold their Sunnyside Extension mine, between the Sunnyside and the Sound Democrat, to the Gold Prince company in 1903. They developed it into a producer. The Gold Prince company built Colorado's largest concentration mill at Animas Forks and built a tramway to its mine at the head of Placer Gulch. The Silverton and Northern Railroad extended its line to Animas Forks to serve the mill, and the Animas Power Company extended its utility line to the mill and mine. Because of the Gold Prince, the Sound Democrat mine was near cheap power and transportation, making it a promising property. Further, its proximity to the Sunnyside and Gold Prince mines tempted speculators.²¹

On September 23, 1905, J. B. Ezell of Pine Bluff, Arkansas bought the Sound Democrat mine from William G. White for \$20,000. With a local partner, J. W. Walker of Eureka, he began to open the mine, which already had 800 feet of tunnels, and ordered machinery to work it. Ezell also incorporated the Arkansas Mining and Tunnel Company to be the operating entity, though he was the primary owner with

his son. The company would fund the erection of the Sound Democrat mill and would operate the mine.²²

C. The AM&TC's Sound Democrat Mill

On July 28, 1905, the Silverton Miner announced a sale of "great importance to this county." William G. White had sold the Sound Democrat to J. B. Ezell of Pine Bluff, Arkansas and J. W. Walker. The new owners had sent a crew to open the mine and had ordered machinery for a mill to work the ores. The machinery was "expected on the ground in 90 days." The article continued: "This property has been worked for a number of years and has made an excellent showing, but has not been worked in a manner to show what it is actually worth." It concluded, "The MINER makes a guess that the public will hear great things from this property when the new owners get their operation in thorough shape."

The Silverton newspaper's weekly mining column followed the development of the Sound Democrat. On October 20, 1905, the newspaper noted that mine manager J. W. Walker had work started and would keep a good force busy all winter on the Sound Democrat. The designer of the Sound Democrat mill is unknown. Mining man Walker most likely designed the plant on a standard model and ordered the machinery from mine supply catalogs. The Silverton newspaper noted his management of operations. In the fall, the mine crew built a tramway from the mine to the mill site; the newspaper also noted that the mill machinery was delayed and possibly shipped to the wrong locale. Although the mill site had been excavated and timber delivered to the site for framing, the close of the season in December found the Arkansas Mining & Tunnel Company still without its mill machinery.²³

In June 1906, the Silverton Miner noted the arrival of J. B. Ezell to begin active work on constructing the company's twenty ton capacity mill. Unfortunately, the newspaper does not give the details of the mill's construction, unlike the other, contemporary mills being constructed in the Eureka District at that time. The Gold Prince 100-stamp mill, the Hercules, the Sunnyside and others are described in detail; but these were major operations and the details of the Sound Democrat may have been overlooked because it was too small.

The newspaper does refer to the Sound Democrat mill as to be a ten-stamp mill. No evidence at the site today indicates that the mill had ten stamps. Instead, the mill contains two batteries of two Nissen stamps each. The Chicago Mining World of October 17, 1905, described the Nissen stamp battery as an advance in ore crushing. A two-stamp battery was equal to a regular five-stamp battery. The Sound Democrat mill's four Nissen stamps were thus equal to ten regular stamps. In September 1906, the mill was reportedly test run.²⁴

The Silverton Miner's special sixty-five page, illustrated edition on the San Juan Mountains mining industry, dated September 27, 1907, does not list the Sound Democrat mill in the list of mills of the county. This suggests that the mill was not in operation. The slow delivery of machinery, the slow construction of the Animas Power company's line to the district, and the winter shut down combined to strain the finances of the company. The winter also threatened operations. Snow slides had destroyed the buildings at the nearby Sunlight camp and the new Green Mountain mill as well as damaged the railroad. Finally, national economic conditions would cause the end to the Arkansas Mining and Tunnel Company.²⁵

In 1907, the mining industry in the West was crippled by the national Panic. The high metal markets for copper and lead had collapsed causing Western smelters to stop purchasing ores and to curtail operations. This in turn caused mine operators to close or go bankrupt. Though the Sound Democrat was reportedly "going ahead" in the summer of 1907 and the owners were, the Silverton Miner reported, to "get the stamp mill to drop," the mill was not operated and was not listed as one of the shippers in the county. During the Panic of 1907, the nearby Gold Prince and Gold King companies went into bankruptcy. On July 22, 1907, J. W. Walker's interest in the Sound Democrat was sold to the Arkansas Mining and Tunnel Company. The Eureka District entered a two year slump; the Sound Democrat was idle in 1908.²⁶

D. The Queen-Democrat and Expansion of the Sound Democrat Mill

In the summer of 1909, the American Smelting & Refining Company, operator of the Durango smelter, announced that it would again buy lead ores and concentrates. The revival of the mining industry hinged on being able to sell mill concentrates to the smelter. With the general mining revival, the Sound Democrat was again in the news. Joe Terry, manager of the Sunnyside mine and leaser of the Sound Democrat in the 1890s, had again leased the mine and mill. The Terrys also consolidated their operation with D. B. Smith and the adjacent Silver Queen mine. During the summer of 1909 Joe Terry completed a surface tram from the Silver Queen to the Sound Democrat aerial tram terminal and began shipping ore. Also, the mine became known as the Queen-Democrat.²⁷

Joe Terry remodeled the mill. The plant was increased in size and new machinery was put in place. For the first time, the mill produced concentrates. The Silverton newspaper noted that "a trial run was made at the mill which proved quite successful, after which the mill was given a thorough overhauling and much new machinery was added."²⁸ Unfortunately, no details are given as to what machinery was added. Terry may have added to the mill the three-stamp battery to the four Nissen stamps. The battery is a typical prospect battery.²⁹

Joe Terry added new concentration tables. The tables in the mill today are standard sixteen-foot Wilfley tables. A newer concentration level was probably added to the lower end of the mill in 1909. This lowest level of the mill is collapsed today; it is a complete ruin indicating that it was a separate addition to the still standing upper levels. Most likely, the mill was totally overhauled with a new jaw crusher, a new electric motor, a new water line and power lines. Unfortunately contemporary sources are silent. The U. S. Bureau of Mines, which published a list of all mills in the United States in 1911, lists the Sound Democrat, but does not detail its machinery. Other mills in the Eureka District have complete lists of machinery. The Sound Democrat is only listed as an amalgamation and concentration mill of 30 tons capacity.³⁰

During 1910, Terry managed the operation of the Queen-Democrat mine and mill. Terry, manager of the Sound Democrat in 1898-1899 and 1909-1910, is responsible for the present appearance of the Sound Democrat mill. Joseph T. Terry was born in 1874 in Canyon City. His father, John H. Terry, arrived in Colorado from Ohio in 1859, during the Pikes Peak gold rush. John Terry helped open the Gregory lode at Central City and was manager of its mine and mill in the 1860s. He was one of Colorado's foremost mining men when he turned his interest to cattle ranching near Canyon City and became a county judge. In 1886 Judge Terry acquired an interest in the Sunnyside mine and with his sons, William and Joe, opened it into one of the biggest gold producers in the San Juan Mountains. Joe Terry learned the mining business through his work at his father's mine and mill, which he joined at age twenty. He operated various mines on lease, including the Sound Democrat, until 1901, when he became superintendent at the Sunnyside. He managed that property until 1909, when he again became interested in developing the Sound Democrat. After his father's death on July 16, 1910, he returned to the management of the Sunnyside mine. He operated the mine and mill until 1917, when the Sunnyside was sold to the United States Mining, Smelting and Refining Company. He continued his interest in the area's mines. On February 1, 1924, he died at age 50.³¹

Joe Terry was a rule-of-thumb mining man. Although he lacked a mining engineer's degree, he learned the practical skills of a miner and mill man through work at his father's properties. The jerry-built seven-stamp, Sound Democrat mill reflects a pragmatic, crude design rather than a standard, engineer- designed stamp mill. Under Terry, however, the Sound Democrat mill did produce. During 1909-10, the Silverton Miner kept statistics of monthly concentrate and ore shipments for the mining district. During June and July 1910, Terry shipped 150 tons of mill concentrate. In August, only crude ore was shipped, some 25 tons. This indicated either that rich ore was found which was more cost effective to ship than mill or that problems with the mill had developed. The latter is more likely.³²

Also, Joe Terry had other concerns. His father Judge Terry had died in July, and the management of the Sunnyside mine again came under his direction. The Queen-Democrat mine was closed both because the operation was marginal at best and because the Sunnyside would take Joe Terry's full energy. The Sound Democrat mill, always the property of J. B Ezell and the Arkansas Mining & Tunnel Company (AMTC), was not worked by that company. In 1914, the AMTC property was removed from the county tax rolls, indicative of its low value. In 1921, Ezell filed a location notice for the Pine Bluff mill site and all its improvements, which was the site known as the Sound Democrat mill. This ensured his preemptory title but also may indicate that machinery was beginning to be removed from the derelict Sound Democrat mill. An attempt to revive the operation in the 1920s failed.³³

E. Conclusion

The Sound Democrat mill, built in 1905-6 and remodeled in 1909, served one of the many small mines of the San Juan Mountains of southwest Colorado. The mine's production is unknown, but was probably less than \$20,000, if shipments reported in the Silverton newspapers are accurate. The mill is a common example of an amalgamation and concentrations stamp mill found throughout the gold regions of the United States, from the southern Appalachians to Alaska. After the turn-of-the-century, amalgamation and gravity concentration mills were being replaced with the new technology of cyanide gold extraction and concentration by flotation. Stamp mills were obsolete by the time the scrap drives of two world wars caused their demolition and the removal of machinery. The Sound Democrat mill is significant because it survived these scrap drives. Because the mill retains all its milling machinery, it is the best remaining example of an amalgamation stamp mill in the San Juan Mountains and it may be the last of its kind in Colorado.

III THE SOUND DEMOCRAT MILL

A. DESCRIPTION

On August 27 and 28, 1991, a field team measured and surveyed the extant machinery and engineering works at the Sound Democrat mill. The mill sits on a slope on the south bank of Placer Gulch, in a natural bowl surrounded by Treasure Mountain, California Mountain, Houghton Peak, and Hanson Peak. The ruins of mines and mills stand near the structure. The collapsed Mastodon mill (1885) is 300 feet to the north on the opposite bank of Placer Gulch, also known historically as Mastodon Gulch, and the ruins of the Hanson or Sunnyside Extension mill (1888) are approximately one-half mile to the west at the head of Placer Creek and near the Gold Prince mine.³⁴ The ruins of the Gold Prince surface works (1905) are one half mile distant and the tramway system (1905) from the mine to the mill in Animas Forks, approximately 12,000 feet in length, has standing towers and remnants of support structures. The Sunlight mine works and the Silver Queen mine works have building ruins visible from the Sound Democrat mill. Adits can be seen in nearly every outcrop in the basin. The mining landscape and mountainous setting are striking.

The mill is connected to the Sound Democrat mine by a 1100-foot aerial tramway. At the mine, approximately 700 feet higher than the mill, are the ruins of the tram terminal and the mine portal. A surface, rail tram connects the Silver Queen mine with the Sound Democrat terminal. The rail tram was removed for a four wheel drive vehicle road cut along the mountain's steep slope. Tram rail can be found along the road. The mine portal is open but the field team did not enter it. Mine rails extend from the portal to the aerial tramway terminus. The terminus has brackets and timber bracings, which once supported the rock crusher and tramway equipment. This equipment is not extant. A small, upright engine manufactured by the American Well Works of Aurora, Illinois is partially buried at the base of the tram terminus. This may have powered the rock crusher and aerial tram, but evidence of the system is minimal. The tram cable has been cut and only a small remnant remained at the anchor boxes. The aerial tramway bull wheel, bucket supports, and bracings have been removed.

The tramway was a Bliechert system, two wire line. Remnants of the wire lay on the ground between the mine and mill. An 8" guide wheel can be found halfway between the mine and mill, indicative of a tramway support in between. The tram tension line was 1" wire and the power line was 1/2" wire. The tension line lays on the ground along the valley floor to the mill. At the mill, the tramway bull wheel, bucket supports, and bracings have also been removed.

The mill is divided into six levels. The first level was the tramway terminus and ore chute to the second level. All power equipment for the tramway has been removed. The tension line is still connected to braces in the terminus's back wall and then goes to the rock-filled anchor boxes, and finally extends an additional 275' to anchors in the rocks across Placer Gulch. Beneath the tram terminus is a water tank. The steel rings of the water tank (marked ECTECKTONIUS, PAT Mar 20, 94, Racine, WI), floor and pipe into the mill remain. The wooden walls of the tank were removed as was the pipe line to the Golden Prince mine, which supplied the water. This pipeline route can be traced across the alpine tundra the half mile from the Sound Democrat mill to the Gold Prince mine adit.

The second level of the mill contains the jaw crusher, a "Samson Crusher" built by McFarland & Co, Denver. An opening at the base of the tram terminus leads to a wooden chute to the crusher. Ore, which had already been reduced in size at the mine tram terminus before loading in tram buckets, was dumped down the chute. The mill's primary crusher reduced the ore to 3" or smaller size. A small, 3" bucket, elevator lifted the ore from beneath the jaw crusher to the top of the ore bin, where it fell in. Also on the second level was the blacksmith shop and the engine room, which will be described separately.

The third level contains the ore bin. At the base of the ore bin are seven "automatic" ore feeders. Metal doors, opened by screw gears, allowed the ore to fall from the bins to the feeders. The feeders are badly rusted and have no manufacturers' markings. A walking ramp at the ore bin's base allowed access to the feeder controls. A hand gear, still present, adjusted the rate of flow of ore. A metal chute, still part of the feeder, dropped the ore into the back of the stamp mortars. An extant water pipeline fed into each of these feeder chutes, mixing water with the ore before it entered the stamp mortar.

The next level, the fourth, contained the stamp batteries. These crushed the ore until it was fine enough to pass through fine wire screens and onto the amalgamation plates. The stamp batteries have been partially salvaged -- cam shafts are missing as are three of the stamps, from stem to shoe. The mill has seven stamps in an odd, jerry-rigged arrangement. The first two stamps have 8" diameter shoes and were built by Fairbanks Morse & Co., Denver, CO. The next two are Nissen Stamps, 10" diameter made by Fairbanks Morse with a patent date of Nov. 29, 1904. These four stamps are in one battery.

The next stamps, or south battery, are in an oddly arranged three-stamp battery. It appears to be a separate addition to the mill and could operate separately from the other four stamps. On this three-stamp battery, the stamp stems and shoes are missing. On the battery is stenciled "A. M. T. C., Animas Forks" [Arkansas Mining & Tunnel Company]. No manufacturer markings can be found. The flywheel on the

cam shaft has "Leadville" stenciled on the rim. At the base of the stamps are screens.

Beneath the stamps were the amalgamation plates. These were copper plates on which a thin layer of mercury was poured. Mercury removed the gold from the finely crushed ore. The copper plates have been removed. Two of the wooden bases for the plates are on the ground on the north side of the mill. The third remains in place beneath the three-stamp battery. The troughs which carried the crushed ore from the base of the amalgamation plates to the concentration tables are not in situ, but are scattered about the ruins of the mill's lower two levels.

The fifth and sixth levels of the mill are in ruinous condition. The roof has collapsed over the building and the sixth level walls have caved in. These two levels contain the concentration machinery, which are in upheaval. The fifth level of the mill has three concentration tables and the sixth or lowest level has two concentration tables. The tables appear to be standard 16' Wilfley Tables. Unfortunately, no manufacturer markings can be found. All the tables are off their mounts. The power machinery is scattered. The connecting troughs are in jumbles under the collapsed roof and walls.

The remains of a road pass along the front of the mill. There is no evidence of a loading platform, though one may have been located on the north east corner of the building. The collapsed walls of the mill partially cover the spot. A rock wall edges the road, it being built up from the sloping landscape. From the loading platform, the sacked concentrate was taken to the railroad station at Animas Forks, two miles distant for transshipment to smelters. The tailings, or waste, poured from the mill tables via flume or pipe -- no evidence of which remains -- to the tailings dump approximately 200 feet down the slope.

Electricity was used for power in the mill. Remnants of the power line -- collapsed power poles, wire, and insulators -- can be seen along the ground from the mill up the slope to the north to the nearest Gold Prince mine tram tower, which also served as power pole for the area's electrical line.

The mill was powered by an electric motor that has been removed. Pulley fragments and wheels remain in the mill. The electric motor powered the mill machinery by a belt system. The main power shaft is located beneath the ore bin, at the second level height. A five foot diameter power wheel is affixed to the power shaft in line with the site of the electric motor. The power shaft has two smaller wheels. Six feet from the main power wheel, a two foot diameter wheel had a belt to the jaw crusher. It also operated the elevator, but its power wheel has fallen from the roof to the floor, making its power belt source uncertain; it either ran off the main power shaft wheel or off a wheel from the jaw crusher.

The second small wheel on the power shaft was six feet north of the main wheel. It served a power shaft located adjacent the stamp batteries. The power shaft is missing, though wear on the stamp frames indicates the location of the drive wheel. This power shaft operated the stamps and operated a series of wheels which in turn powered the concentration tables. These latter power shafts and wheels have fallen to the floor, among the collapsed roof and walls. This system of belts and drive wheels can no longer be retraced.

The mill building sits alone. However, evidence of other buildings can be discerned. Three leveled areas, where the grass grows greener because of moisture capture, are the possible location of the mill office and housing for workers. Archeological testing has not been undertaken. Evidence of occupation -- tin cans, bottle fragments, debris -- is minimal on the surface.

Near the mill, in the bottom of Placer Gulch, two splash dams and a pipeline feed the Mastodon mill site, downstream. Another pipeline crosses below the mill and the creek also leads to the Mastodon mill site. An adit near creek level is opposite the Sound Democrat mill but was not connected with its operation. The field team did not enter it. A bridge across Placer Gulch to the mill has been washed downstream ten feet.

The present road crosses the creek bottom and winds around in front of the mill, below the historic wagon road. The road is four-wheel drive only. Evidence of modern-day camping abound. Lumber from the mill was evident in the half dozen fire rings around the site. Bureau of Land Management staff noted that during the three month summer season an estimated 80,000 people visit the ghost town of Animas Forks, two miles away.

B. MODIFICATIONS

There is no evidence of upgrading the mill to include the flotation or cyanide processes. These processes had replaced amalgamation and gravity concentration by World War I. The date of removal of the electrical equipment, the tramway system and the parts of the stamp batteries is unknown.

C. OWNERSHIP AND FUTURE

The Bureau of Land Management administers the land on which the mill stands. The mill is derelict on public lands. It will continue to collapse because of snow loads, vandalism, and benign neglect.

IV. PROJECT STATEMENT

This project was undertaken by the Rocky Mountain Regional Office, National Park Service, under the Direction of Robert Spude, Chief, Division of National Preservation Programs. A field team documented the site on August 27 and 28, 1991. Field documentation of the building was carried out by architect Christopher R. Jones (NPS) and civil engineer Peter J. Badcock (English Heritage) under the supervision of historical architect Thomas G. Keohan (NPS). Field team members who examined the site, and the extant machinery and engineering works consisted of Bureau of Land Management staff: historian/photographer Frederic J. Athearn, archaeologist Rich Fike, and archaeologist W. Max Witkind; NPS historian Robert L. Spude; and volunteers Duane Smith, Fort Lewis College history professor, and Glen Crandell of Durango. Archival photography was completed by Frederic J. Athearn. Architectural delineation was completed by Karen Hardaway from the office of Andrews & Anderson, in Golden, Colorado. Funding for this project was provided by the Colorado State Office of the Bureau of Land Management.

V. ENDNOTES

1. A. H. Koschmann and M. H. Bergendahl, Principal Gold-Producing Districts of the United States, A Description of the Geology, Mining History, and Production of the Major Gold-Mining Districts in 21 States, U.S. Geological Survey Professional Paper 610 (Washington, D. C.: G. P. O., 1968), pp. 4-5.
2. On investment see Clark C. Spence, British Investments and the American Mining Frontier, 1860-1901 (Ithaca, New York: Cornell University Press, 1958), pp. 77-120; Joseph E. King, A Mine to Make a Mine: Financing the Colorado Mining Industry, 1859-1902 (College Station: Texas A & M Press, 1977), passim; the Comstock was perhaps best known for lost investments and big bonanzas, see Grant H. Smith, The History of the Comstock Lode, 1850-1920 (Reno: University of Nevada, 1943), pp. 188-9. On the list of mills see Bureau of Mines, Annual Report Upon the Mineral Resources of the United States for 1911 (Washington: G.P.O., 1912), passim.
3. Interview with Duane Smith, Glen Crandall, Richard Fike, and Frederick Athearn, at Sound Democrat Mill, August 28, 1991. Smith and Crandall have explored and written about the San Juan mining region for twenty years.
4. On stamp mills and amalgamation see Otis E. Young, Jr., Western Mining: an Informal Account of Precious-Metals Prospecting, Placering, Lode Mining, and Milling on the American Frontier from Spanish times to 1893 (Norman: University of Oklahoma, 1970), passim.; H. William Axford, Gilpin County Gold: Peter McFarlane, 1848-1929, Mining Entrepreneur in Central City, Colorado (Chicago: Sage Books, 1976), pp. 47-59; T. A. Rickard, The Stamp Milling of Gold Ores (New York: The Scientific Publishing Company, 1898), pp. 1-56; John V. N. Dorr, Cyanidation and Concentration of Gold and Silver Ores (New York: McGraw-Hill, 1936), passim.
5. Koschmann and Bergendahl, Principal Gold-Producing Districts, p. 114; C. W. Henderson, Mining in Colorado: a History of Discovery, Development and Production, U.S.G.S. Professional Paper 138 (Washington: G.P.O., 1926).
6. Frederik Leslie Ransome, A Report on the Geology of the Silverton Quadrangle, Colorado, U.S. Geological Survey Bulletin 182 (Washington, D.C.: G.P.O., 1901), pp. 179-181; Wilbur S. Burbank and Robert G. Luedke, Geology and Ore Deposits of the Eureka and Adjoining Districts, San Juan Mountains, Colorado, U.S. Geological Survey Professional Paper (Washington, D.C.: G.P.O., 1969), p. 66.
7. Allen Nossaman, Many More Mountains, Volume 1, Silverton Roots: an Illustrated History of the Earliest Exploration in the High San Juans of Southwestern Colorado and of the Settlement and Founding of Silverton, Colorado (Denver: Sundance Books, 1989), pp. 139-140; Allan G. Bird, Silverton Gold: The Story of Colorado's Largest Gold Mine (1986), pp. 5-6, 13.

8. On August 7, 1875, Henry Promer located the Sound Democrat Claim on Treasure Mountain above Placer Gulch. The claim is 1500' by 300' in accordance with federal and territorial laws (the federal law allowed 600' widths but Colorado law limited claims to 300' in certain districts). Location notice filed for record September 14, 1875 in Record Book 3, p. 353, County Clerk's Office, San Juan County Court House, Silverton, Colorado.

On September 30, 1886 Henry Promer and James K. Herring relocated the Sound Democrat lode and more accurately described boundaries. The claim was described in relation to the Mastodon Mill below, along Placer Gulch, and Alfred A. Marten's Almaden claim. Location notice filed for record October 1, 1886 in Record Book 77, p. 172. On August 24, 1888 Henry Promer and James Herring applied for patent for the Sound Democrat claim. Mineral Survey # 2686 shows the lode was opened by three cuts and one tunnel. The survey also subtracted from the original boundary of the claim, portions for the adjacent, previously located Castaway, Salamanca, and Adirondic patented claims. Patent signed April 20, 1891 by President Benjamin Harrison. Filed for record San Juan County April 12, 1895 in Patent Book A-3, pp. 377-9, County Clerk's Office, Silverton.

9. For a history of mining in the region and its broader context see Duane A. Smith, Song of the Hammer and Drill: The Colorado San Juans, 1860-1914 (Golden: Colorado School of Mines Press, 1982; Robert L. Brown, An Empire of Silver: A History of the San Juan Silver Rush (Caldwell, Idaho: Caxton Printers, 1965); Duane A. Smith, Colorado Mining: A Photographic History (Albuquerque: University of New Mexico Press, 1977), passim; Rodman W. Paul, The Far West and the Great Plains in Transition, 1859-1900 (New York: Harper & Row, 1988), pp. 254-282; Rodman Wilson Paul, "Colorado as a Pioneer of Science in the Mining West," The Mississippi Valley Historical Review 47 (June 1960): pp. 34-50.

10. Bird, Silverton Gold, p. 23; Smith, Colorado San Juans, pp. 49-50; Ransome, Geology, p. 179-181; Robert Athearn, The Denver and Rio Grande Western Railroad: Rebel of the Rockies (New Haven: Yale University Press, 1962), pp. 104-5.

11. On stamp mills and concentration see Otis E. Young, Jr., Western Mining, passim; Axford, Gilpin County Gold, pp. 47-59; Rickard, The Stamp Milling of Gold Ores, pp. 1-56; and John V. N. Dorr, Cyanidation and Concentration of Gold and Silver Ores (New York: McGraw-Hill, 1936), passim.

12. On the Wilfley table see Jay E. Niebur and James E. Fell, Jr., Arthur Redman Wilfley: Miner, Inventor, and Entrepreneur (Denver: Colorado Historical Society, n. d.).

13. On the smelting business see Duane A. Smith, Rocky Mountain Boom Town (Albuquerque: University of New Mexico, 1980), pp. 9-10, 17-18, 77-8; Isaac F. Marcossou, Metal Magic: The Story of the American Smelting and Refining Company (New York: Farrar, Straus and Company, 1949), pp. 64-5; James E. Fell, Jr., Ores to Metals: The

Rocky Mountain Smelting Industry (Lincoln: University of Nebraska Press, 1979), pp. 189-93, 214-6, 226-8, passim.

14. Mining and Scientific Press, October 7, 1905, pp. 236, 240; Trenton Iron Works, Tramways catalogue ca. 1905 in Eben Olcott Papers, New York Historical Society; T. A. Rickard, Across the San Juan Mountains (New York: The Engineering and Mining Journal, 1903), which was reprinted with better tramway graphics in T. A. Rickard, Journeys of Observation (San Francisco: Dewey Publishing Co., 1907), part II, pp. 68-73.

15. Smith, San Juans, pp. 91-106; and Bird, Silverton Gold, pp. 45-69; For booster descriptions of new mills, tramways and electricity see San Juan County (Silverton: Standard, 1899), passim and The Golden San Juan, special illustrated edition, Silverton Miner September 27, 1907.

16. Robert E. Sloan and Carl A. Skowronski, The Rainbow Route: An Illustrated History of the Silverton Railroad, The Silverton Northern Railroad and the Silverton, Gladstone & Northerly Railroad (Denver: Sundance Publications, 1975), passim; thumb nail histories of Eureka and Animas Fork are in Muriel Sibell Wolle, Stampede to Timberline: The Ghost Towns and Mining Camps of Colorado (Boulder: Muriel S. Wolle, 1949), pp. 404-410; see also Muriel Sibell Wolle, Timberline Tailings, Tales of Colorado's Ghost Towns and Mining Camps (Chicago: Sage Books, 1977), pp. 285-296; Perry Eberhart, Guide to the Colorado Ghost Towns and Mining Camps (Chicago: Sage Books, 1959, revised 1969); Robert L. Brown, Jeep Trails to Colorado Ghost Towns (Caldwell, Idaho: Caxton Printers, 1963, revised 1981), pp. 46-52, 83-87; Sandra Dallas, Colorado Ghost Towns and Mining Camps (Norman: University of Oklahoma Press, 1985), pp. 12-13, 74-75; and John K. Aldrich, Ghosts of the Western San Juans (Lakewood, Colorado: Centennial Graphics, 1988), pp. 9-10, 17-18. Only Eberhart mentions the Sound Democrat mine.

17. On August 5, 1895 Henry Promer, James Herring, W. B. Rose and Carrie B. Rose sold the Sound Democrat claim to William G. White. Filed for record August 16, 1895, Book 95, p. 300, County Clerk's Office, San Juan County Court House, Silverton, Colorado.

18. Silverton Standard, October 12, 1895, December 31, 1897.

19. Bird, Silverton Gold, pp. 61-73, 83-7; Denver Times December 31, 1898, December 31, 1899, January 29, 1900; Silverton Standard December 31, 1897.

20. Bird, Silverton Gold, pp. 71-3; Mining and Scientific Press, October 14, 1905, p. 266.

21. Sloan and Skowronski, The Rainbow Route, pp. 200-210; The Golden San Juans,

special illustrated edition, Silverton Miner September 27, 1907 describes in detail the Gold Prince operation.

22. Silverton Weekly Miner July 28, October 20, 1905; on September 23, 1905, William G. White and John A. James sold the Sound Democrat claim for \$20,000 to J. B. Ezell of Pine Bluff, Arkansas and J. W. Walker of San Juan County. Ezell was to own 37/40 interest and Walker was to own 3/40 interest. Agreement filed for record on July 22, 1907, Record Book 102, p. 464, County Clerk's Office, San Juan County Court House, Silverton, Colorado.

23. Silverton Weekly Miner July 28, September 1, October 20, November 3, 1905.

24. Silverton Weekly Miner June 8, 1906; Silverton Standard September 1, 1906.

25. Golden San Juans, special illustrated edition of Silverton Miner, September 27, 1907, p. 9, this special edition though ready for publication in December 1906 did not appear until September 27, 1907; Silverton Weekly Miner June 8, 15, August 31, December 28, 1906.

26. Silverton Weekly Miner July 19, September 13, 1907.

27. Silverton Weekly Miner July 23, August 20, October 8, December 31, 1909; Bird, Silverton Gold, pp. 108, 113.

28. Silverton Weekly Miner December 31, 1909.

29. Mining and Scientific Press, October 7, 1905, p. 247, August 25, 1906, p. 240. The Nissen stamp came into disrepute when the owners of the Garfield mill near Bingham, Utah discarded its concentrator with 360 Nissen stamps for ball mills.

30. U. S. Bureau of Mines, Mineral Resources of the United States for the Year 1911 (Washington, D.C.: G.P.O., 1912), p. 525.

31. Bird, Silverton Gold, pp. 127-128.

32. Silverton Weekly Miner July 8, August 5, September 9, 1910.

33. Bird, Silverton Gold, pp. 111-114; Silverton Weekly Miner December 22, 1910; Silverton Standard August 21, October 23, 1926. J. B. Ezell of Pine Bluff, Arkansas filed location notice for Pine Bluff Mill Site on October 15, 1921. The notice stated that he has long owned all improvements on mill site, and the filing was just to confirm ownership of mill site. Location notice filed October 15, 1921 in Book D-2, p. 569, County Clerk's Office, San Juan County, Silverton, Colorado.

July 34. The Sound Democrat mill was mistaken for the Hanson Mill until recently. BLM intern R. G. Aly prepared histories of both the Hanson mill and the Mastodon mill during the summer of 1990. The reports provide data on the ruins of these mills--the Hanson had all machinery removed and the only sign of its twenty stamps are their solid wood bases. The Mastodon has been crushed by many winters of snow cover, but it does have some machinery. The mill ruins have the double compartment jig (built by the Ft. Scott, Kansas Foundry in the tri-state lead district), one trommel, and debris of the Wilfley tables underneath the mill's collapsed walls and roof. See R. G. Aly, "Historic Resource Evaluation of the Hanson Mill," 1990 and R. G. Ally, "Historic Resource Evaluation of the Mastodon Mill," 1990 in the Montrose District files, Bureau of Land Management, Montrose, Colorado.